Interference in Large Wireless Networks

Martin Haenggi and Radha Krishna Ganti

Interference is the main performance-limiting factor of large wireless communication systems. To analyze and design these networks, it is thus imperative that the interference is statistically characterized or bounded in the presence of various sources of uncertainty, including the users' positions, their patterns of activity, and the channel fading states.

Interference in Large Wireless Networks addresses this problem using basic probability and tools from stochastic geometry. Starting with regular networks and the popular Poisson model, it discusses increasingly more general networks. In addition to the interference itself, it also derives explicit expressions for outage probabilities, which are indispensable for the optimization of higher-level metrics such as the transport capacity or end-to-end delay.

Interference in Large Wireless Networks includes an appendix that reviews the underlying mathematical tools, which makes it self-contained and suitable for graduate students, researchers, and wireless engineers alike.